

# Improved Stability of Mercuric Iodide Detectors for Anticoincidence Shields, Phase I

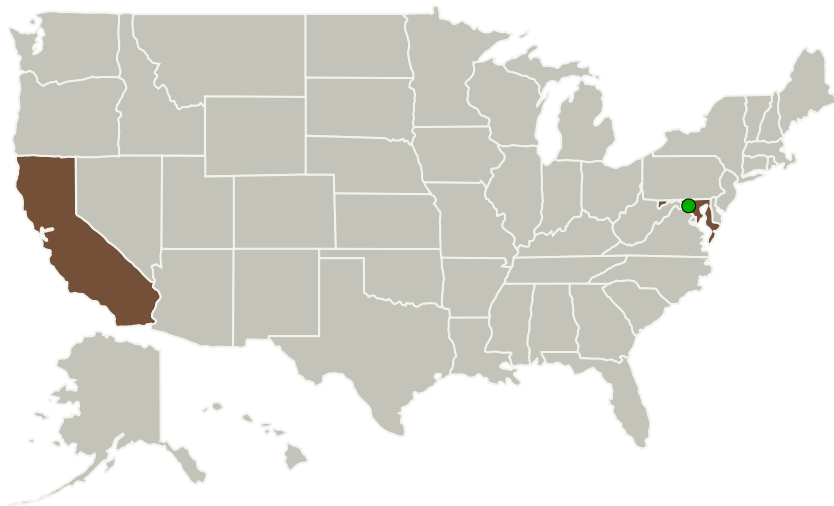
Completed Technology Project (2011 - 2011)



## Project Introduction

We propose to utilize guard ring electrode structures and a new film growth technique to create improved polycrystalline mercuric iodide detectors for background suppression by active anticoincidence shielding in gamma-ray spectrometers. Two proposed NASA missions will require anticoincidence shielding for x-ray and gamma-ray spectrometers: the High Energy Telescope of the EXIST (Energetic X-ray Imaging Survey Telescope) mission, and the Space Science Vision Mission expected to visit Titan, one of Saturn's moons. Shielding improves the performance of x-ray and gamma-ray spectrometers by reducing the effect of charged particle interactions which cannot be distinguished from true x-ray and gamma-ray interactions by the spectrometer. Active shields produce a blanking signal when a charged particle is detected, so that the signal from the spectrometer can be ignored during the spectrometer's charged-particle interaction. While it is well known that this technique produces significant improvement in x-ray and gamma-ray spectrometer performance, the technology to implement it is lacking. The attributes of mercuric iodide make it an excellent candidate for anticoincidence shielding detectors. Because of its detection characteristics, light weight, small size, low cost, robustness, and ease of application to non-planar geometries, this material can replace the costly, heavy, and bulky scintillator/photomultiplier tube (PMT) systems currently in use.

## Primary U.S. Work Locations and Key Partners



Improved Stability of Mercuric Iodide Detectors for Anticoincidence Shields, Phase I

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

## Improved Stability of Mercuric Iodide Detectors for Anticoincidence Shields, Phase I

Completed Technology Project (2011 - 2011)



Organizations Performing Work	Role	Type	Location
DxRay, Inc.	Lead Organization	Industry	Northridge, California
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
California	Maryland

## Project Transitions

▶ **February 2011:** Project Start

✓ **September 2011:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138629>)

## Organizational Responsibility

## Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

## Lead Organization:

DxRay, Inc.

## Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

Carlos Torrez

## Principal Investigator:

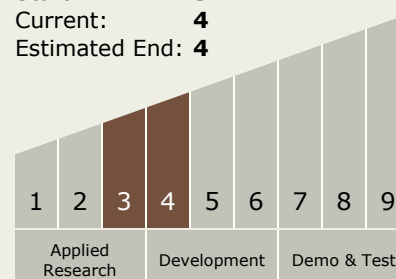
Neal Hartsough

## Technology Maturity (TRL)

Start: 3

Current: 4

Estimated End: 4



# Improved Stability of Mercuric Iodide Detectors for Anticoincidence Shields, Phase I

Completed Technology Project (2011 - 2011)



## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.1 Remote Sensing Instruments/Sensors
    - └ TX08.1.1 Detectors and Focal Planes

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System